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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,271	11/26/2003	Kwang-cheol Oh	033808-008	6479

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EXAMINER	
SHAH, PARAS D	

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/721,271	OH ET AL.	
	Examiner	Art Unit	
	Paras Shah	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-9,14,15,18-21,24-26, and 31* is/are rejected.

7)☒ Claim(s) *5,6,10-13,16,17,22,23,27-30,32 and 33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/26/2003, 05/10/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is in response to the Application filed on 11/26/2003.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement filed 11/26/2003 and 05/10/2004 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered. The information disclosure statement contains foreign patents for which no translation of the abstract is provided.

Claim Objections

4. Claim 8 is objected to because of the following informalities: "[[]]" should be omitted as seen in line 1. Appropriate correction is required.

5. Claim 8 is objected to because of the following informalities: "a vocal frame" should be "the vocal frame" as seen in line 3 should be omitted. Appropriate correction is required.

6. Claim 10 is objected to because of the following informalities: "a fricative frame" should be "the fricative frame" as seen in line 3 should be omitted. Appropriate correction is required.

7. Claim 15 is objected to because of the following informalities: "in claim 10" should be "in claim 14" as seen in line 1. The Applicant introduces the color noise in claim 14. Claim 10 does not incorporate the limitation of color noise. Appropriate correction is required.

8. Claim 15 is objected to because of the following informalities: "[[]]" should be omitted as seen in line 1. Appropriate correction is required.

9. Claim 25 is objected to because of the following informalities: "a vocal frame" should be "the vocal frame" as seen in line 3 should be omitted. Appropriate correction is required.

10. Claim 27 is objected to because of the following informalities: "a fricative frame" should be "the fricative frame" as seen in line 3 should be omitted. Appropriate correction is required.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1, 2, 18, 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Janiszewski (US 5,657,422) *et al.* in view of Ching *et al.* ("Enhancement of Speech Signal Corrupted By High Acoustic Noise").

As to claims 1 and 18, Janiszewski discloses a voice region detection apparatus, comprising: a preprocessing unit for dividing an input voice signal into frames (see col. 3, lines 56-60 and col. 2, lines 5-8); a whitening unit for combining white noise with the frames (see col. 3, lines 4-6) input from the preprocessing unit (see Figure 2, elements 260 and 270) (e.g. From the figure it can be seen that the speech signal s[i] passes through element 270 and white noise is inserted); frame state determination unit for classifying the frames into voice frames and noise frames (see col. 3, lines 66-67-col. 4, lines 4 and lines 15-19) (e.g. it is shown in the reference that classification is done based on the energy level of the frame and hence classification between speech and non-speech is done); and a voice region detection unit for detecting a voice region by calculating start and end positions of a voice based on the voice and noise frames input from the frame state determination unit (see Figure 1, element 50) (see col. 3, lines 66-67-col. 4, lines 4 and lines 15-19) (e.g. It is implied by the reference that the start and end position are known in order to identify the non-speech and speech segments of in the input signal). However, Janiszewski does not specifically disclose the use of a random parameter extraction unit for extracting random parameters. Ching *et al.* discloses the finding of frame-to-frame randomness that is input from the signal (see Abstract and page 1115, right column, 2nd paragraph). It would have been obvious to one of ordinary skilled in the art at the time the invention was made to have combined

the teachings of , Janiszewski with the calculating of the frame randomness as presented by Ching *et al.* The motivation to have combined the two references involve the reduction of noise by frame and to make use of any correlation between frames (page Ching *et al.* 1115, right column, 3rd paragraph) as would have been seen by the frames of the input signal discussed by Janiszewski *et al.*

As to claim 2 and 19, Janiszewski discloses wherein the preprocessing unit samples the input voice signal frames (see col. 3, lines 56-60 and col. 2, lines 5-8) according to a predetermined frequency (see col. 2, lines 5-8) (e.g. It is apparent that dividing the number of samples by the length of the frame will give the sampling frequency (160/20ms=8kHz)) and divides the sampled voice signal into a plurality of frames (see col. 2, lines 5-8) (e.g. Also, it is implied that the speech signal will be divided into frames by the length of each frame. The reference refers to the background and uses the method of VSELP).

As to claim 4 and 21, wherein the whitening unit comprises a white noise generation unit for generating white noise (see Figure 2, element 260 and col. 9, lines 21-24), and a signal synthesizing unit for combining the frames input from the preprocessing unit with the white noise generated by the white noise generation unit (see col. 9, lines 31-36 and Figure 2, element 270) (e.g. The element 270 acts as a synthesizer for adding the white noise in the speech signal).

13. Claims 3 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Janiszewski in view of Ching *et al.* as applied to claim 2 above, and further in view of Mekuria (US 6,182,035).

As to claims 3 and 30, Janiszewski and Ching *et al.* do not specifically disclose the frames overlapping with one another. Mekuria does disclose the overlapping of frames (see col. 8, lines 28-29). It would have been obvious to one of ordinary skilled in the art at the time the invention was made to have combined the teachings of Janiszewski and Ching *et al.* with the overlapping of frames presented by Mekuria. The motivation to have combined the two references involves the use of samples in more than one frame (see Mekuria col. 8, lines 28-29) of the teachings of Janiszewski and Ching *et al.*

14. Claims 7-9 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Janiszewski in view of Ching *et al.* as applied to claim 1 above, and further in view of Pastor (US 5,572,623).

As to claims 7 and 24, Janiszewski and Ching *et al.* do not specifically disclose the voice frames including vocal frames and fricative frames. Pastor does disclose the frames including vocal and fricative frames (see col. 4, lines 66-67 and col. 5, lines 5-14). It would have been obvious to one of ordinary skilled in the art at the time the invention was made to have combined the teachings of Janiszewski and Ching *et al.* with the inclusion of fricative frames. The motivation to have combined the two references involves the inclusion of fricatives that are present in at the start and end of speech (see Pastor col. 1, lines 29-33) as would be seen in the noisy speech signal discussed by Janiszewski and Ching *et al.*

As to claims 8, 9, 25, and 26, Janiszewski discloses wherein the frame state determination unit (e.g. voice activity detector) determines if the random parameter (e.g.

As seen in Ching *et al.*) of a frame extracted by is below a first threshold, then it is a vocal frame (see col. 7, lines 39-51) (e.g., It is seen that is the noise is below the value of the frame energy, then speech is present or vocal frame. The use of a specific threshold would have been obvious to one skilled in the art in order to distinguish voice from noise. The Applicants do not indicate reasons for selecting the states thresholds (see Applicant's Specification, page 11, lines 17-21).

15. Claims 14,15, and 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Janiszewski in view of Ching *et al.* as applied to claim 1 above, and further in view of Rezayee *et al.* ("An Adaptive KLT Approach for Speech Enhancement").

As to claim 14, Janiszewski and Ching *et al.* do not specifically disclose a color noise elimination unit for eliminating color noise from voice. Rezayee *et al.* discloses the enhancement of speech from colored noise (see Abstract). It would have been obvious to one of ordinary skilled in the art to have combined the teachings of Janiszewski and Ching *et al.* with the inclusion of a color noise eliminator as presented by Rezayee *et al.* the motivation to have combined the references is since colored noise consist of various noise variances and is not the same as white noise, which has same variance (see page 87, right column, 3rd paragraph, lines 12-17) as might be evident in the noisy speech signal disclosed by Janiszewski and Ching *et al.*

As to claims 15 and 31, Janiszewski discloses elimination of noise if below a predetermined threshold (see col. 7, lines 39-51) . The random parameter was disclosed by Ching *et al.* The detection of color noise would have been obvious to include when detecting voice regions for a voice activity detector (see Abstract).

Allowable Subject Matter

16. Claims 5, 6, 10-13, 16, 17, 22, 23, 27-30, 32, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter: None of the prior art alone or in combination teach the following limitations: "calculates numbers of runs consisting of identical elements" as recited tin claims 5, 6, 22, and 23; " second threshold is 1.2", "the first threshold is 0.8 and the second threshold is 1.2" as recited in claims 11, 13, 28, and 30; "... above second threshold, the relevant frame is a fricative frame", "above the first threshold and below the second threshold is a noise frame" as recited in claims 10, 12, 27, and 29; "color noise ... obtained... amount of reduction in the random parameter...due to color noise" as recited in claims 16,17, 32, and 33.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gupta *et al.* (US 5,649,055) is cited to disclose a VAD determining if there is speech activity using thresholds. Marchok *et al.* (US 7,039,181) is cited to disclose a

method and apparatus for VAD with background noise and echo. Fischer *et al.* (2003/0078770) is cited to disclose detection of voice based on decisions of stationarity.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paras Shah whose telephone number is (571)270-1650. The examiner can normally be reached on MON.-THURS. 7:00a.m.-4:00p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571)272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

P.S.
04/04/2007

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